Turbocharged diesel engine

A variant with turbocharged diesel engine (OM660/1) will be available on the market launch of model 451.

The OM660/1 was developed from the OM660 in the predecessor model 450. Particular attention was paid to increasing engine output and engine speed, and to compliance with the emissions criteria for the EU 4 standard. This was achieved in part by increasing the injection pressure from max. 1300 bar to max. 1650.

All the engine control functions for the OM660/1 are integrated in the CDI control unit, which is incorporated into the on-board bus network via the CAN data bus.

Model 451 can be ordered with a diesel particulate filter for exhaust aftertreatment as special equipment. In Germany, Italy and Switzerland the diesel particulate filter is standard equipment.

P01.10-2893-00

3-cylinder turbocharged diesel engine

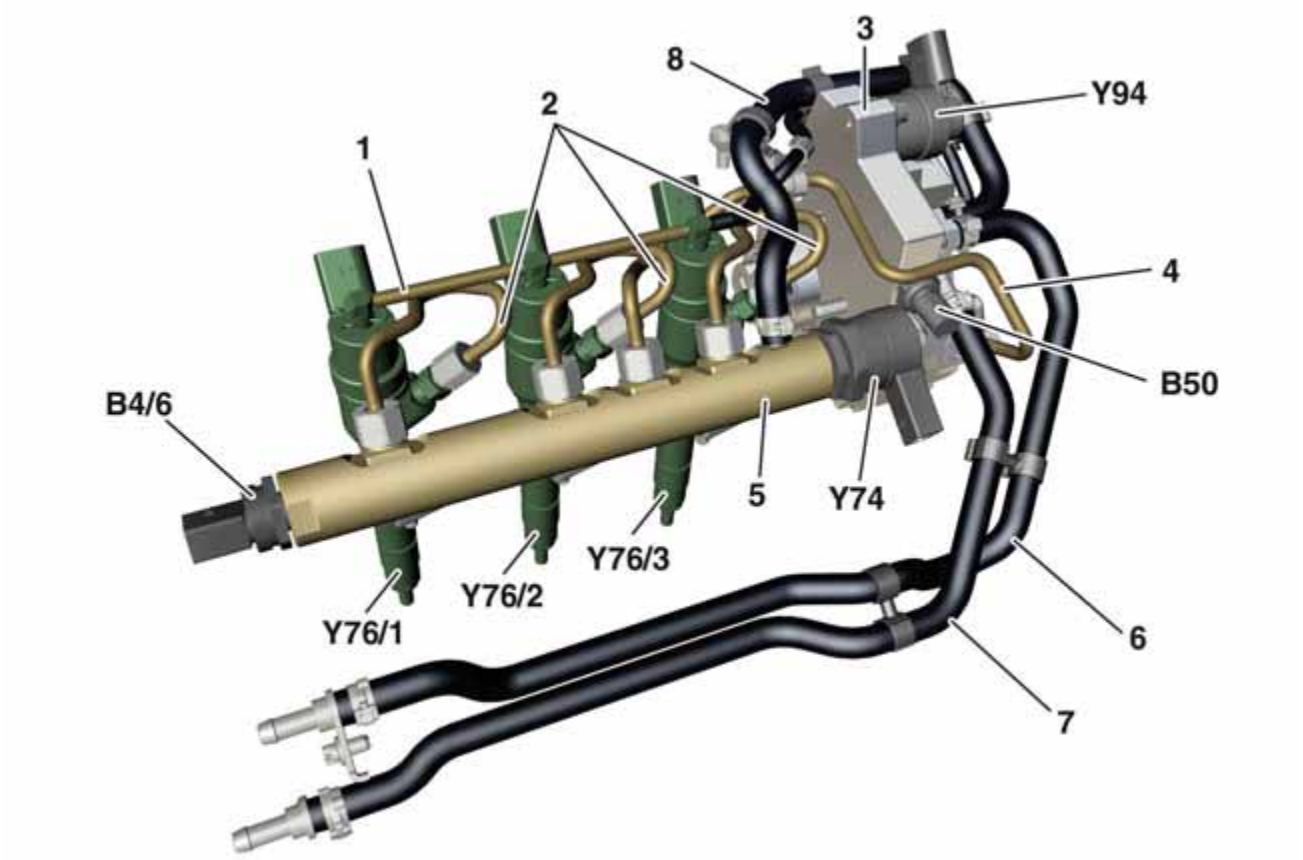
Engine data

OM 660/1		
	Unit	**Turbo diesel**
Engine model designation	M	660.950
Rated output	kW at rpm	33 3800
Rated torque	Nm at rpm	110 2000
Compression ratio	e	18.0:1
Engine configuration/no. of cylinders		inline/3
Camshaft configuration/number		overhead/1
Displacement	cm^3	799
Bore	mm	65.5
Stroke	mm	79
Cylinder angle	°	45
Fuel		Diesel
Emission regulations		EU 4

Illustration of the principle

The fuel pump pumps the fuel from the fuel tank to the high-pressure pump. The high-pressure pump, which is driven by the engine, builds up the required injection pressure in the rail in relation to the operating state of the engine. The fuel injectors are connected to the rail via short high-pressure lines and spray the fuel straight into the combustion chamber.

The CDI control unit registers the rail pressure via the rail pressure sensor. It regulates accordingly via the pressure regulator valve and the quantity control valve. Furthermore, the CDI control unit controls the opening time and duration of the injectors.
This results in economical, low-pollutant and low-noise combustion.



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Diesel engine injection system

1	*Leak oil line*	*B4/6*	*Rail pressure sensor*
2	*High-pressure lines*	*B50*	*Fuel temperature sensor*
3	*High-pressure pump*	*Y74*	*Pressure regulator valve*
4	*High-pressure line*	*Y76/1*	*Cylinder 1 fuel injector*
5	*Rail*	*Y76/2*	*Cylinder 2 fuel injector*
6	*Fuel feed line*	*Y76/3*	*Cylinder 3 fuel injector*
7	*Fuel return line*	*Y94*	*Quantity control valve*
8	*Fuel return line (rail)*		

Diesel injection system

Injection control

Engine OM660/1 is developed from the previous OM660. The central control unit of the engine is the CDI control unit. It is networked over CAN with the following components:

- Instrument cluster
- Automated manual transmission control unit
- Heater/AC operating unit
- ESP control unit
- Steering assist control unit
- Data link connector

The CDI control unit puts its information on the CAN, making it accessible to all the other networked components on the CAN.

Direct input signals come from:

- Hot film mass air flow sensor
- Rail pressure sensor
- Charge pressure sensor
- Coolant temperature sensor
- Intake air temperature sensor
- Accelerator pedal sensor
- Fuel temperature sensor
- O2 sensor upstream of TWC [KAT]
- Crankshaft position sensor
- Oil pressure switch
- Cylinder 1 fuel injector
- Cylinder 2 fuel injector
- Cylinder 3 fuel injector

Direct output signals go to:

- Fuel pump with fuel level sensor
- EGR [ARF] switchover valve
- Pressure regulator valve
- SAM control unit
- Cylinder 1 fuel injector
- Cylinder 2 fuel injector
- Cylinder 3 fuel injector
- Quantity control valve

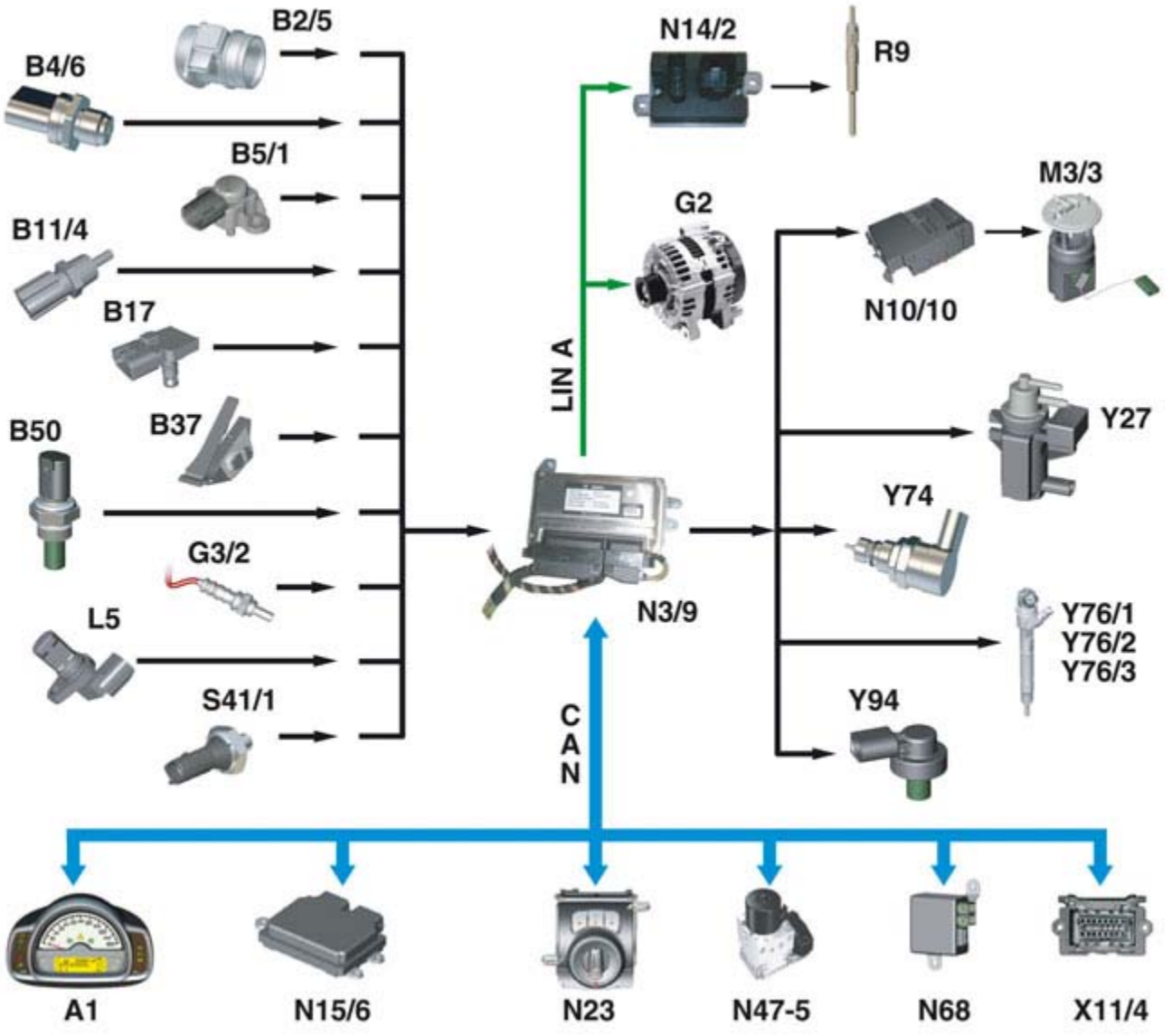
There are also the following inputs on the ME-SFI control unit:

- Circuit 15
- Circuit 30
- Circuit 31

Function

The engine is controlled according to load by the performance map based on the signals arriving either directly or over CAN. The actuators are actuated via direct lines in accordance with the values computed by the CDI control unit. Information intended for other components is put on the CAN.

The CDI control unit has an integral fault memory and can exchange information with STAR DIAGNOSIS via a data link connector that is connected to the CAN.



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A1	*Instrument cluster*
B2/5	*Hot film mass air flow sensor*
B4/6	*Rail pressure sensor*
B5/1	*Charge pressure sensor*
B11/4	*Coolant temperature sensor*
B17	*Intake air temperature sensor*
B37	*Accelerator pedal sensor*
B50	*Fuel temperature sensor*
G2	*Alternator*
G3/2	*O2 sensor upstream of TWC [KAT]*
L5	*Crankshaft position sensor*
M3/3	*Fuel pump with fuel level sensor*
N3/9	*CDI control unit*
N10/10	*SAM control unit*
N14/2	*Glow output stage*
N15/6	*Automated manual transmission control unit*
N23	*Heater/AC operating unit*
N47-5	*ESP control unit*
N68	*Steering assist control unit*
R9	*Glow plugs*
S41/1	*Oil pressure switch*
X11/4	*Data link connector*
Y27	*EGR [ARF] switchover valve*
Y74	*Pressure regulator valve*
Y76/1	*Cylinder 1 fuel injector*
Y76/2	*Cylinder 2 fuel injector*
Y76/3	*Cylinder 3 fuel injector*
Y94	*Quantity control valve*
CAN	*Controller Area Network (data bus/CAN bus)*
LIN A	*CDI local interconnect network*

Engine cooling

Bleeding coolant circuit

General

When coolant is drained from the diesel engine, the cooling system must be filled using a vacuum filler unit.

Filling

Unscrew the cooling system cap. Assemble the vacuum filler unit according to the manufacturer's instructions and connect it to the expansion reservoir using the adapter (special tool).

Evacuate the cooling system with the vacuum filler unit until the specified vacuum is obtained. Then open the feed lever on the vacuum filler unit to allow the coolant to enter the coolant circuit.
Disconnect the vacuum filler unit from the expansion reservoir, top up the expansion reservoir to the "MAX" mark and screw on the cooling system cap.
Warm up the engine until the thermostat opens.
Switch off the engine and check the coolant level in the expansion reservoir.

Note
The cooling system must be filled and bled only when the engine is cold.

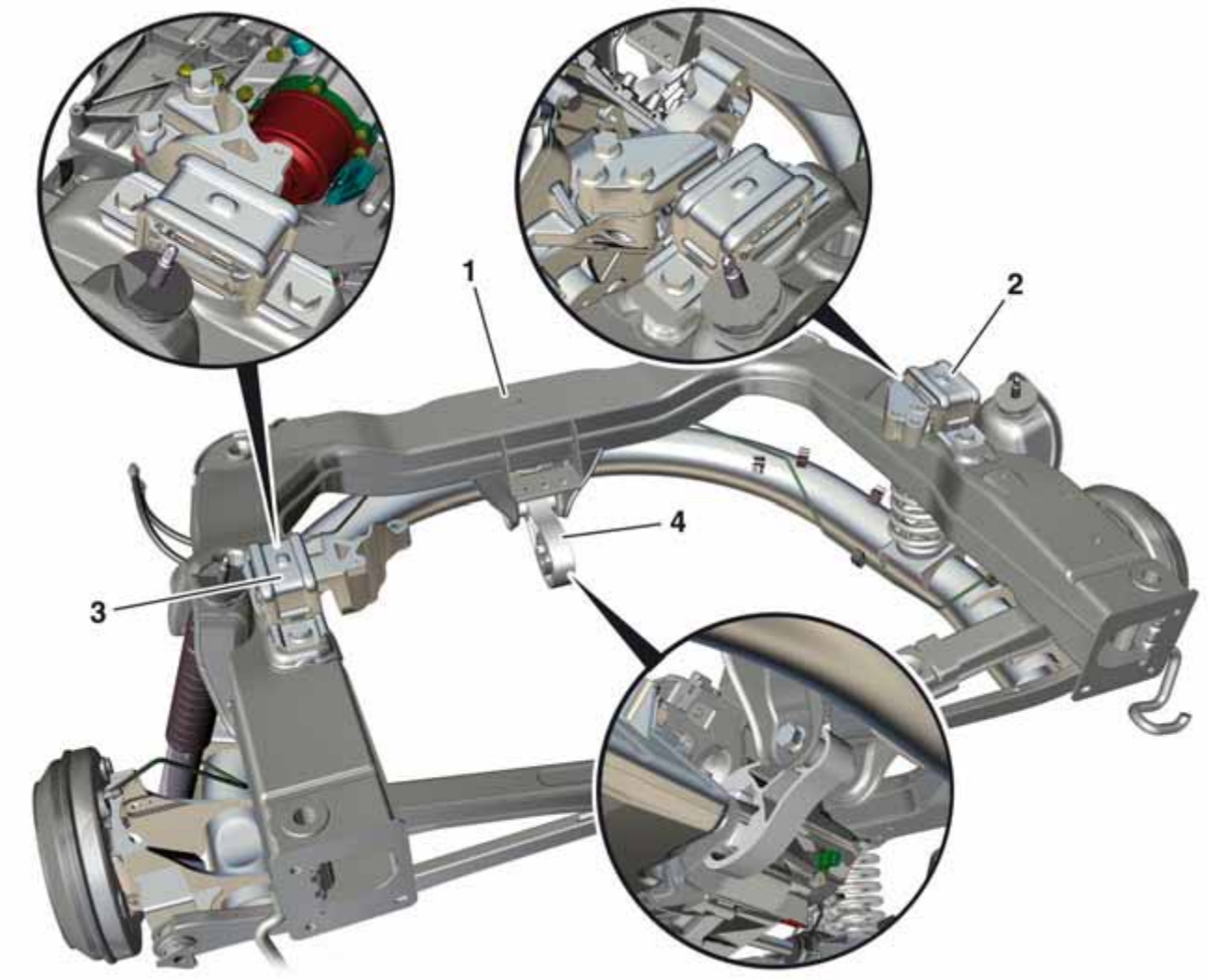
P20.20-2330-00

Bleeding cooling circuit

1 Vacuum filler unit
2 Expansion reservoir
3 Adapter

Engine mount/torque support

New engine mounts have been developed for the diesel engine. They were designed to dampen inherent engine vibrations. They also considerably reduce the rocking of the drive assemblies during load changes. Reducing vibrations and the tendency to rock significantly improves driving safety and ride comfort.



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Torque support

1 Frame-type integral support
2 Engine mount
3 Transmission mount
4 Torque support